

REMARKS

By this Amendment, Applicants have amended the specification to provide clear antecedent basis for the language of claim 22 and have amended the claims to more clearly define their invention. In particular, the claims have been amended to eliminate the indefiniteness problem and the informalities noted by the Examiner in numbered sections 2-6 of the office action. Claim 2 has been amended to recite that the contact plate is molded in the frame. See, page 9, lines 7-10 of applicants' specification. Claim 5 has been amended to be a dependent claim, dependent on amended claim 2. Claim 6 has been rewritten in independent form. Claim 15 has been amended to recite that a molded or sprayed on insulating layer is applied by spraying or molding arranged adhesively to a side of the contact plate remote from the reception side for the heating PTC elements. See, page 11, lines 15 to page 12, line 13 of applicants' specification.

Especially in view of the foregoing amendments to the specification (to provide clear antecedent basis for the language of claim 22), it is submitted the drawings show every feature of the claimed invention, including the retaining webs recited in claim 22 in the form of heat conducting lamellae 12 in Fig. 8. Accordingly, reconsideration and withdrawal of the objection to the drawings in numbered section 1 and the objection to claim 22 in numbered section 6 of the office action are requested.

In view of the foregoing amendments to the claims, reconsideration and withdrawal of the rejection of claims 2-19 under 35 U.S.C. §112, second paragraph, in numbered sections 1-4 and the objection to claims 2 and 21 in numbered section 5 of the office action are requested.

Claims 2-4, 11, 12 and 21 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,426,573 to Fudickar et al. Applicants traverse this rejection and request reconsideration thereof.

The present invention relates to, *inter alia*, a device for receiving ceramic heating elements, i.e., PTC elements in a heating device, having an insulating frame and at least one contact plate held in the insulating frame and on which can be placed the heating PTC elements. According to the present invention, the contact plate is molded in the frame. In this way, the contact plate cannot be drawn out of the frame without damaging the frame. See, e.g., page 9, lines 14-17 of applicant's specification.

The patent to Fudickar et al discloses a heating element that comprises an electrically non-conducting support body having a pair of opposite faces and formed with a plurality of through-going holes opening at the faces, respective electrically energizable heating capsules in the holes and each having one end exposed at one of the faces and an opposite end exposed at the other of the faces, and a pair of respective conductors lying on the faces in electrical contact with the respective exposed ends of the capsules. A tight hermetic skin surrounds and encapsulates the body with the capsules in the holes and the conductors on the faces. A pair of respective wires extending through the skin and connected to the conductors serve for passing electricity through the heating capsules. The skin effectively protects the assembly from moisture when installed in a heater. In addition this skin protects the heating element prior to installation and can in fact eliminate the need for a shipping package.

More particularly, the drawings of Fudickar et al show a device 1 for receiving

PTC elements 2 in the device, having art insulating synthetic resin frame 7 covered by a contact plate 5, on which can be placed the FTC elements. The arrangement is surrounded by a tough skin 8 of silicone rubber, wherein the skin is prestressed in tension, in order to urge the conductor plate into snug engagement with the PTC elements (col. 4, lines 59-64). Thus the cited document teaches the use of an additional element, silicone rubber skin 8, which holds the whole arrangement together, including PC elements and rubber skin.

The Fudickar et al. patent does not disclose a contact plate that is molded in the frame. There is no information in Fudickar et al., that the contact plate cannot be drawn out of the frame without damaging the frame. In particular, when removing the rubber skin, there is no stable connection between the two elements. In contrast, according to the present invention, as set forth in independent claim 2, the contact plate is molded in the frame itself. In this way, the contact plate cannot be drawn out of the frame without damaging the frame. Such is neither disclosed nor suggested by Fudickar et al.

Claims 5 and 9 stand rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,665,261 to Damsohn et al. Applicants traverse this rejection and request reconsideration thereof.

The Damsohn et al. patent, as can be most clearly seen in Figure 5 and as described at column 6, lines 16 et seq. of Damsohn et al., discloses metal plates 5 and 6 that enclose the PTC elements 15 and its sealing frame 7 between them. The surfaces of metal plates 5 and 6 are provided with a silicon-based adhesive corresponding to the shape of the sealing frame 7. Figure 5 shows the exploded representation of the constituent parts. As soon as the PTC elements 15 have been

inserted into the openings 2 of the sealing frame, the second metal plate is positioned thereon and the parts are then pressed against one another at a suitable pressure. The Examiner refers to the disclosure at column 6, lines 55-63 of Damsohn et al., which indicates that this results “in a frictionally locking connection of the metal plates 5 and 6 via the sealing frame 7.” However, Damsohn et al., the contact plate 5 or 6 is not held in the insulating frame 7. Rather, the insulating frame 7 is joined adhesively between the contact plates 5 and 6. Thus, neither contact plate 5 nor contact plate 6 of Damsohn et al., is frictionally held in frame 7. To the contrary, in Damsohn et al., the frame 7 is adhered between the contact plates 5 and 6. Therefore, clearly this patent does not disclose a contact plate molded in the frame itself, as presently claimed.

The Damsohn et al. patent merely teaches a connection of the silicon frame 7 to the contact plates 5 by means of an adhesive, but reveals simultaneously the disadvantage of this arrangement, i.e., that a reliable application of the adhesive is tedious and must be conducted selectively with respect to location of the PTC elements 15. Screen-printing is suggested as a solution (col. 3, lines 58-63). The additional processing step and the additional use of an adhesive means is unfavorable, but also the lack of durability and bonding strength of the resulting connection are also disadvantageous. These disadvantages can be overcome by the subject matter of the present invention, which therefore provides a reliable, cheaper and simpler solution, i.e., by contact plate being molded in the frame itself, as presently claimed. Such is neither disclosed nor suggested by the Damsohn et al. patent. Accordingly, the Damsohn et al. patent does not anticipate the presently claimed invention.

Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over

Damsohn et al., in view of U.S. Patent No. 4,835,370 to Van Bokestal. Applicants traverse this rejection and request reconsideration thereof.

As admitted by the Examiner, the Damsohn et al. patent does not teach a contact plate covered by a polymer ceramic or ceramic cover layer, as set forth in claim 13.

The Examiner alleges the Van Bokestal et al. patent discloses a PTC heating device having an insulating polymer ceramic 5 covering a contact plate 4. It is submitted the Examiner's allegation is in error. Element 5 of Van Bokestal et al. is a layer consisting of a silicone elastomer (see, column 2, line 52 of Van Bokestal et al). The casing 6 is molded, for example, from a vulcanized silicon rubber, which is filled with magnesium oxide and silicon dioxide; see, column 2, lines 48-50 of Van Bokestal et al. Thus, the Van Bokestal et al. patent does not disclose a contact plate covered by a polymer ceramic or ceramic cover layer. A polymer ceramic is a ceramic produced by condensation of organometallic compounds into merely inorganic materials by proper thermal treatment under a controlled atmosphere as described in the two publications, i.e., by Weinmann et al and An et al., describing polymer ceramics, also called precursor-derived ceramics (PDC), attached to the amendment filed March 29, 2005. Thus, in addition to not remedying the basic deficiency noted above with respect to Damsohn et al., the Van Bokestal et al. patent does not disclose the subject matter set forth in claim 13. Accordingly, claim 13 is patentable over the proposed combination of Damsohn et al. and Van Bokestal et al.

Claims 15-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Damsohn et al., in view of Van Bokestal. Applicants traverse this rejection and request reconsideration thereof.

Claims 15-19 require a molded or sprayed on insulating layer arranged adhesively to a side of the contact plate remote from the reception side for the heating PTC elements.

Damsohn et al. does not disclose an insulating layer in any form that is arranged to a side of the contact plate remote from the reception side for the PTC elements.

The Van Bokestal et al. patent does not disclose holding elements for holding the heating elements to prevent slipping on the contact plate. Furthermore, the insulating casing 6 does not show a layer-shape, but has a far more complex structure. The comprehensive fabrication steps (col. 2, lines 48—54) show, that the casing cannot be adhesively molded or sprayed on the contact plate. According to Van Bokestal et al. the casing 6, together with a layer 5 on one side and the metal bodies 3 and 4 (contact electrodes), as well as the resistor bodies 1, 2, are separately manufactured as discrete parts. In order to manufacture the heating element as shown in Van Bokestal et al., the resistor bodies 1 and 2 are inserted between the metal bodies 3 and 4 and all parts are held together in a sandwich-like form and are shifted from the open end of the molded casting into the casting 6. Thus, the sandwiched-like structure produced by Van Bokestal et al. is different than the structure set forth in claims 15-19.

It is submitted even the combined teachings of Damsohn et al. and Van Bokestal et al. would not have suggested the presently claimed invention. Even assuming, *arguendo*, the teachings of these patents would be combined by one of ordinary skill in the art, one would apply each of the heating devices 1, as shown in Damsohn et al., inside a housing 5, as shown in Van Bokestal et al. Further, one of ordinary skill in the art would have extracted from Van Bokestal et al. features of such a housing, which is

to consist of an insulating, heat-conducting material and comprising an abutting area with respect to the contact plates. The latter is ensured by the shape of the housing, which also provides fixing of the insulator around the contact plates.

However, none of the cited documents suggests how to fix an insulator on only one side of one contact plate, or that such a separate arrangement of an insulator is possible in general. This can be achieved by the present invention by employing a molded on or sprayed on insulating layer, which has the advantage of being cheap and simple to manufacture.

Furthermore Van Bokestal et al. points out the importance of elastic properties of an insulator, when used in the described housing. Therefore vulcanized silicon rubber and a silicon elastomer are proposed and most of the description is restricted to irrelevant parameters of the used material, such as viscosity, processing temperatures, etc. However, the precarious choice of materials and parameters can be avoided by applying a simpler arrangement, as is proposed by the present invention. Such an arrangement can especially be applied to insulator materials with non-elastic properties, such as polymer ceramics, as pointed out on page 11, last paragraph of the description and claimed in claim 17. This allows for a material choice mainly based on insulating properties and costs, other parameters are secondary, wherein insulators with non-elastic properties are still preferred.

These features are neither disclosed nor suggested by the proposed combination of Damsohn et al. and Van Bokestal et al.

Applicants note the indication of allowable subject matter in claims 6-8 and 10.


In view of the foregoing amendments and remarks, favorable reconsideration and

allowance of all of the claims now in the application are requested.

Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 321.43756X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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